



Appendix Q

Cleaning and Disinfecting

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Introduction

The *Cleaning and Disinfection* appendix provides formulas, directions, and a list of materials needed to properly clean and disinfect contaminated areas.

Articles That Require Cleaning and Disinfection

If any article or surface is contaminated with an animal material or with spillage from regulated garbage, then that article or surface must be cleaned and disinfected. If you encounter an importation of prohibited or restricted animal products and the packaging or containers holding those products have leaked, then the contaminated pallets, machinery used in handling, dock or warehouse areas used for storage, or trucks or railroad cars used for transporting the products must be cleaned and disinfected before they are reused.



Spills of regulated garbage in areas where food is prepared should be cleaned and sanitized by the caterer using the caterer's product. If a shipment of prohibited or restricted animal products has leaked, then the contaminated pallets, machinery used in handling, dock or warehouse areas used for storage, or trucks or railroad cars used for transporting the product must be cleaned and disinfected before they are reused.

Materials for Disinfectant Kit

Include the following items in the disinfectant kit:

- ◆ Insulated box, such as an ice chest, for holding the materials used to disinfect
 - ❖ Label the box "DISINFECTANT KIT"
 - ❖ Type and affix the directions for its use inside the lid
- ◆ Gallon plastic container filled with water
- ◆ Whisk broom and dust pan
- ◆ Scrub brush and a scraping tool
- ◆ Pint spray bottle
- ◆ Roll of paper towels
- ◆ Leakproof, double, plastic bags to hold collected material

Protective Clothing and Safety Materials

Have the following protective clothing and safety equipment available:

- ◆ Pair of rubber gloves or disposable, plastic gloves
- ◆ Face Shield
- ◆ Disposable, plastic shoe covers
- ◆ Safety goggles
- ◆ Coveralls (necessary only if you must prepare a solution that contains lye) or a rubber apron (if you are using Virkon® S)
- ◆ Plastic bottle of vinegar (necessary only if you use a solution that contains lye—as vinegar neutralizes lye)

Disinfectants

Have the following disinfectants available:

- ◆ One gallon of a premixed, 4 percent sodium carbonate solution



Solutions of sodium carbonate with sodium silicate for use aboard aircraft must be prepared in advance because samples of the solution must be sent to the National Veterinary Services Lab in Ames, Iowa to verify the concentration of each. (See Step 3.) When premixing sodium carbonate, write the date the solution was prepared on the container and discard after 1 year.

- ◆ Virkon® S disinfectant, 1.3 ounces, and a gallon of water to make a gallon of solution.



Never hold premixed Virkon® S solution for more than 7 days. Dispose of solution when it begins to change from yellow to clear.

Directions for Cleaning and Disinfecting

Step 1: Selecting the Appropriate Disinfectant

Use [Table Q-1-1](#) to select the appropriate disinfectant based on the article being disinfected, the animal class involved, and the disease at risk. Then go to [Table Q-1-2](#) for disinfectant mixing instructions.

TABLE Q-1-1 Select the Appropriate Disinfectant


If the article is:	And the source is:	And the risk is:	Then use a solution with water that contains:
Aircraft			4 percent sodium carbonate with 0.1 percent sodium silicate  Never use another disinfectant—it could corrode sensitive aircraft or electronic parts.
Empty semen container			4 percent sodium carbonate carbonate with 0.1 percent sodium silicate
Footwear	Unknown or any combination of animal diseases		1 percent solution of Virkon® S or sodium hypochlorite with 5.25 percent available chlorine (household bleach)

TABLE Q-1-1 Select the Appropriate Disinfectant

If the article is:	And the source is:	And the risk is:	Then use a solution with water that contains:
Other than ¹ aircraft, empty semen container, or footwear	Swine or a pork product	Solely FMD	One of the following: ◆ 1 percent solution of Virkon® S ◆ 4 percent sodium carbonate ² with 0.1 sodium silicate ◆ 0.1 percent solution of sodium hypochlorite
		Solely CSF	Either of the following: ◆ 1 percent solution of Virkon® S ◆ 0.1 percent solution of sodium hypochlorite
		Any combination of ASF, CSF, FMD, and/or SVD	
	Ruminant	→	One of the following: ◆ 1 percent solution of Virkon® S ◆ 4 percent sodium carbonate ³ with 0.1 sodium silicate ◆ 0.1 percent solution of sodium hypochlorite
	Bird or poultry product	→	Either of the following: ◆ 1 percent solution of Virkon® S ◆ 0.1 percent solution of sodium hypochlorite
	Foreign garbage, unknown, or any combination of animals		

- 1 For example, storage area, farm machinery, pallet, fork lift, pier, stall, RR car, any outdoor area contaminated by foreign garbage.
- 2 A 2-percent solution of lye (sodium hydroxide) is an alternate disinfectant, but **never** use this caustic disinfectant unless you have prior approval of a HQ, PPQ, VMO in PPQ, VRS.
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Step 2: Preparing the Disinfectant

Mix the disinfectant using [Table Q-1-2](#) for formulas and instructions. Prepare fresh batches of disinfectant as practicable.



Never use the disinfectants listed in [Table Q-1-2 on page Q-1-5](#) around food or in areas where food is handled or prepared. When disinfecting such areas, allow the use of a sanitizer that is normally used around foods. If the sanitizer will be flushed of, it must be one approved by the EPA. If the sanitizer will **not** be flushed off, it must be one approved by the FDA.

TABLE Q-1-2 Formulas and Instructions for Mixing Disinfectants




If you need a solution of:	And:	Then:
4 percent sodium carbonate (common name soda ash)	→	<div style="display: flex; align-items: flex-start;"> <div style="margin-right: 10px;">  </div> <div> <p>This solution is only mildly caustic but can dull painted and varnished surfaces.</p> </div> </div> <ol style="list-style-type: none"> 1. ADD 5.33 ounces of sodium carbonate to each gallon of water (or 1 pound to 3 gallons of water or 15 pounds to 45 gallons of water) 2. MIX thoroughly
4 percent sodium carbonate with 0.1 percent sodium silicate	→	<ol style="list-style-type: none"> 1. ADD 5.33 ounces of the sodium carbonate to each gallon of water 2. ADD 4 ml of sodium silicate solution to each gallon of water 3. MIX thoroughly 4. GO to Step 3: Checking Concentration of Active Ingredients
Sodium hypochlorite (0.1 percent solution of chlorine bleach)	Concentration of available chlorine ¹ is 5.25%	<div style="display: flex; align-items: flex-start;"> <div style="margin-right: 10px;">  </div> <div> <p>This solution will discolor clothing. Therefore, as a precaution, dry the disinfected item or put the item in a plastic bag. Wear gloves, eye protection, and an apron when applying bleach.</p> </div> </div> <ol style="list-style-type: none"> 1. ADD 5 tablespoons (or 2.5 ounces or 75 ml) of bleach to 1 gallon of water (or 1 gallon of chlorine bleach to 50 gallons of water) 2. MIX thoroughly
	Concentration of available chlorine ¹ is 6.0%	<ol style="list-style-type: none"> 1. ADD 4 tablespoons and 1 teaspoon (2.33 ounces or 65 ml) of bleach to each gallon of water (or 13 cups of bleach to 50 gallons of water) 2. MIX thoroughly
Sodium hypochlorite (0.3 percent solution of chlorine bleach)	Concentration of available chlorine ¹ is 5.25%	<div style="display: flex; align-items: flex-start;"> <div style="margin-right: 10px;">  </div> <div> <p>This solution will discolor clothing. Therefore, as a precaution, dry the disinfected item or put the item in a plastic bag. Wear gloves, eye protection, and an apron when applying bleach.</p> </div> </div> <ol style="list-style-type: none"> 1. ADD 3 gallons of sodium hypochlorite (chlorine bleach) to 2 gallons of water 2. MIX thoroughly
	Concentration of available chlorine ¹ is 6.0%	<ol style="list-style-type: none"> 1. ADD 3 gallons of sodium hypochlorite (chlorine bleach) to 3 gallons of water 2. MIX thoroughly

TABLE Q-1-2 Formulas and Instructions for Mixing Disinfectants (continued)



If you need a solution of:	And:	Then:
Virkon® S 1% solution		<div>  <p>Never pour the water over the Virkon® S powder because the Virkon® S could splash on you. Only add Virkon® S powder to the water. If any of the solution comes in contact with your eyes, immediately flush with water and immediately get medical attention. If the solution comes in contact with your skin, immediately flush with water, then rinse with vinegar.</p> </div> <ol style="list-style-type: none"> 1. PUT on rubber gloves, rubber apron, and face shield 2. ADD 1.3 ounces (or 8 teaspoons or 37 grams) of Virkon® S concentrate to 1 gallon of water 3. STIR gently; do not stir vigorously (the solution should be yellow in color and have a slight citrus odor) 4. RESEAL the container holding the Virkon® S powder 5. POUR the Virkon® S solution (using a plastic funnel) into a 1, 2.5, or 5 gallon plastic container 6. CLOSE the container tightly 7. DISPOSE of solution after 7 days or when the yellow color fades, whichever comes first 8. WASH hands and any other areas where the solution or powder may have come in contact with skin 9. CLEAN the mixing area

TABLE Q-1-2 Formulas and Instructions for Mixing Disinfectants (continued)

If you need a solution of:	And:	Then:
Virkon® S 2% solution		<div style="display: flex; align-items: flex-start;"> <div style="margin-right: 10px;">  </div> <div> <p>Never pour the water over the Virkon® S powder because the Virkon® S could splash on you. Only add Virkon® S powder to the water. If any of the solution comes in contact with your eyes, immediately flush with water and immediately get medical attention. If the solution comes in contact with your skin, immediately flush with water, then rinse with vinegar.</p> </div> </div> <ol style="list-style-type: none"> 1. PUT on rubber gloves, rubber apron, and face shield 2. ADD 2.6 ounces of Virkon® S concentrate to 1 gallon of water 3. STIR gently; do not stir vigorously (the solution should be yellow in color and will have a slight citrus odor) 4. RESEAL the container holding the Virkon® S powder 5. POUR the Virkon® S solution (using a plastic funnel) into a 1, 2.5, or 5 gallon plastic container 6. CLOSE the container tightly. 7. DISPOSE of solution after 7 days or when the solution begins to change color from yellow to clear 8. WASH hands and any other areas where the solution or powder may have come in contact with the skin 9. CLEAN the mixing area

- 1 Determine the percent of available chlorine by checking the container's label. Sodium hypochlorite (chlorine bleach) comes in two concentrations: 5.25 percent or 6.0 percent available chlorine.

Step 3: Checking Concentration of Active Ingredients

When using sodium carbonate with sodium silicate to disinfect aircraft, check the concentration of the active ingredient(s) before use.¹

Send a sample of the disinfectant to the National Veterinary Services Lab to check the concentration of active ingredients, as follows:

- 1 If applying sodium carbonate to **other than** aircraft, checking the concentration of the disinfectant is recommended, **not** mandatory.

1. Collect 3 to 4 ounces of the solution and put it in a plastic container.



Never use a glass container.

2. Complete VS Form 10-4, Specimen Submission. See [page A-1-105](#) for directions on completing the form. In *Block 8* of VS Form 10-4, write “Examination requested is for the concentration of sodium carbonate and sodium silicate.”
3. Send the sample along with the completed VS Form 10-4 to the following address:

APHIS-USDA
National Veterinary Services Lab
Toxicology/Chemistry Section
1800 Dayton Avenue
P.O. Box 844
Ames, IA 50010

Phone: 515/663-7266
FAX: 515/663-7397

After you have the results of the lab test or field test, use lab results along with the [Table Q-1-3](#) to determine whether to use the disinfectant.

TABLE Q-1-3 Determine Whether or Not to Use Disinfectant Based on Results of Laboratory Test

If the results show that the concentration of the soda ash is:	Then:
Between 4.0 and 4.5 percent	USE the disinfectant
Below 4.0 percent	1. DO NOT use the disinfectant 2. MIX another batch
Above 4.5 percent	3. GO to Step 2., page Q-1-4)



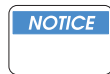
Never use the premixed solution of sodium carbonate until the test results show the appropriate concentration of active ingredient. If using aboard aircraft, the lab test should also show a 1/10 of 1 percent concentration of sodium silicate.

Step 4: Removing Excess Contaminant

Sweep up or scrape off as much of the contaminant as possible. Put the sweepings or scrapings into a leakproof, plastic bag for incineration later. Free surfaces from dirt and grease if applicable.

Step 5: Scrubbing Contaminated Area

Scrub the contaminated area or the area where the spillage occurred with a good detergent solution.



If the area is **not** effectively scrubbed first, then any viruses protected by the organic material remain untouched and the disinfectant is **not** effective.

Step 6: Flushing Scrubbed Services

Flush the scrubbed surfaces with clean water. Flushing is important because the detergent may react with the disinfectant and reduce its activity.

Step 7: Applying Disinfectant

If using a premixed solution of disinfectant, agitate thoroughly. If the temperature is below freezing, delay the application of the disinfectant until the temperature is above freezing. Apply the disinfectant to the point of runoff. Following any application of lye, rinse off the disinfectant with water to prevent corrosion.

Step 8: Incinerating Refuse

Incinerate all refuse that was swept up or scraped off.

Sources of Supply for Disinfectants and Cleaning Materials

Use [Figure Q-1-1 on page Q-1-10](#) to order disinfectants and cleaning supplies.

Appendix QSources of Supply for Disinfectants and Cleaning Materials

FIGURE Q-1-1 Sources of Supply for Disinfectants and Cleaning Materials

Item:	Source of supply:
Bags, leakproof	GSA (National Stock Number 05-01-221-3236)
Bottle, spray	GSA (National Stock Number 25-00-488-7952)
Broom, whisk	GSA (National Stock Number 20-00-240-6350)
Brush, scrub upright	GSA (National Stock Number 20-00-068-7903)
Brush, scrub, hand held	GSA (National Stock Number 20-00-061-0038)
Dustpan, upright	GSA (National Stock Number 90-00-634-1996)
Dustpan hand held	GSA (National Stock Number 90-00-224-8308)
Goggles, safety	GSA (National Stock Number 40-00-052-3776)
Lye, 100-pound drum	GSA (National Stock Number 10-00-174-6581)
Lye, 1 pound can	GSA (National Stock Number 10-00-270-8177)
Sodium carbonate, 100-pound drum	GSA (National Stock Number 10-00-233-1715)
Sodium hypochlorite (household bleach)	Purchase locally at grocery, hardware store, etc.
Virkon® S 10-pound pail	Double-R Discount Supply 321/768-1912 or < http://www.dblrsupply.com/ >